

# PATENT ABSTRACTS OF JAPAN

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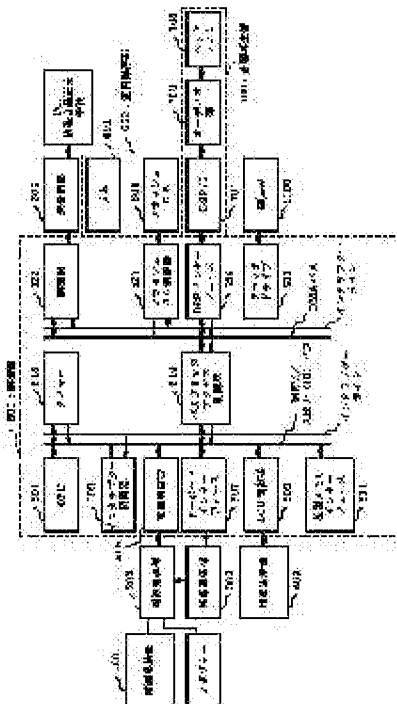
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## (54) **PORTABLE SOUND REPRODUCING DEVICE AND SOUND REPRODUCING METHOD USING MPEG SYSTEM**



(57)Abstract:

**PROBLEM TO BE SOLVED:** To exclude the deterioration of sound source data due to carelessness in sound recording, repetitive reproduction, and storage by compressing learning and other sound source data in MPEG format and storing them in a memory chip, and then restoring and reproducing the compressed data to sound data that a human can listen to.  
**SOLUTION:** When a key input signal applied from an information selection part 300 is detected, a CPU 501 loads selected arbitrary sound source data into a DSP part 701 through a DSP interface 529 on condition that the detected key signal is judged to be a key signal for reproducing the arbitrary sound source data saved in a material storage part 600, and the digital sound source data compressed in the MPEG format are restored by an operation program at a DSP part 701 and the converted into a sound

signal through an audio part 703. The converted electric sound signal is converted into a sound source signal that a user can listen to through headphones or speakers 705 and outputted.

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## CLAIMS

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[Claim(s)]

[Claim 1] The power source of said current supply means A current supply means to consist of a rechargeable battery and to supply a power source [ required for a load ] of operation in a portable sound system; A stable electrical potential difference, The power-source processing means and; operating state which rectify on a current are embraced. A message A figure And the display means and; which are displayed in written form Preservation of the sound-source data of an MPEG method The general actuation to restoration playback A preservation means to save at the address address which has the sound-source data information of an MPEG method specified according to the signal impressed from the control means to control and the; aforementioned control means; the general actuation to the playback, backup, and employment of arbitration of sound-source data which were saved for said preservation means An information selection means to choose; so that people can hear the sound-source data saved for the preservation means according to the signal impressed from said control means The portable sound system using the MPEG method characterized by consisting of transceiver means to be connected with the sound reproduction means and; external instrument to change, and to transmit and receive sound-source data and program data.

[Claim 2] Said power-source processing means is a portable sound system using the MPEG method according to claim 1 characterized by supplying the charging current to the rechargeable battery of said current supply means when an external power source is impressed through an adapter.

[Claim 3] Current music begins the forward switch which carries out rapid-traverse playback in continuing pushing on the following music 1 second or more, when pushing said information selection means 1 or less second, and; 1 or less second push. To or

former music If it pushes once, The reverse switch which carries out rewinding playback in continuing pushing; Playback, The safety switch with which it will stop and a power source will be shut off if it pushes again in the state of playback; One music will be repeated if it pushes once. The portable sound system using the MPEG method according to claim 1 characterized by consisting of a repetitive switch of which a repetitive setup will be canceled if it pushes twice and will continue pushing whole repeatedly, and a random performance switch made to perform at random irrespective of the sequence of; music.

[Claim 4] In termination of CPU (arithmetic and program control) which controls actuation for said control means to change the digital sound-source data saved in the MPEG method into the sound which people can hear, and; input/output operation, or the case of an I/O mistake The interrupter controller which outputs the control signal for controlling actuation of said CPU; The power source impressed from said power-source processing means is stably supplied to the power source of CPU of operation. In the case of error generating The keyboard interface which carries out interfacing of the key selection signal impressed from the; aforementioned information selection means to the power control machine which outputs the control signal for intercepting a power source; The current supplied to the row and column of said information-display means is controlled. For the LCD controller which controls the display embodiment of operating state,; program, or the escape of a memory area Connection of the extended ROM added The timer which counts a hour entry required for playback of the extended ROM interface and the backup actuation of; data which carry out interfacing, and the backed-up data, and the interrupter of data required for systems operation; I/O of the data transmitted and received The controller to control; the control signal for controlling I/O of the digital sound data compressed into the flash plate ROM controller which activates the flash plate ROM of said preservation means according to the interrupter control signal impressed from said CPU, and;MPEG method The portable sound system using the MPEG method according to claim 1 characterized by consisting of clock drives which process the DSP interface and; oscillation clock to output in the predetermined condition, and are driven to said CPU side as a clock signal.

[Claim 5] Said preservation means is an volatile storage with which the information remembered that a power source is shut off disappears. It is the non-volatile storage with which the information memorized even if the ram and; power source which are used as an extraordinary preservation location while the power source is impressed were shut off does not disappear. The portable sound system using the MPEG method according to claim 1 characterized by consisting of a flash plate ROM which digital sound-source data and program data are saved, and can delete the saved data information.

[Claim 6] DSP which said sound reproduction means processes the digital sound-source data compressed into the MPEG method in the predetermined condition, and is restored; it is a portable sound system using the MPEG method according to claim 1 characterized by consisting of an audio circuit which changes into an electric acoustic signal the digital sound-source data restored by said DSP.

[Claim 7] If a setup of the process in which carry out loading of the main program and an execution environment is set up, and; execution environment is completed after initializing a system in the case of the current supply by said information selection means the selection signal of an information selection means, a power-source condition of

operation, connection existence with an external power, and connection existence with external communication equipment -- the sound reproduction approach using the MPEG method characterized by including playback of the saved sound-source data, and the process in which backup preservation of data is performed, by how.

[Claim 8] The sound reproduction approach using the MPEG method according to claim 7 characterized by including further the phase of stopping activation actuation while outputting an error signal if a main program will be performed, ipsefact will be set up if a power source is impressed and the phase and; main program which detect whether there are any abnormalities in a main program are normal after initializing CPU and a circumference circuit, and abnormalities are in a main program.

[Claim 9] In the phase and; above which judge whether it is a signal for intercepting a power source of operation when actuation of arbitration is performed by the execution environment and the keying signal impressed from an information selection means is detected In the phase and; above which will judge whether it is a playback selection signal if it is not a power-source cutoff signal In the phase and; above which judge whether it is a signal for choosing the data after the sound-source data by which current selection was made if it is not a playback selection signal In the phase and; above which judge whether it is a signal for choosing the sound-source data earlier data by which current selection was made if it is not the signal which chooses the data after the data by which current selection was made If it is not a signal for choosing the data earlier data by which current selection was made In the phase and; above which judge whether it is a selection signal for stopping the playback actuation which is among a present progressive If it is not the phase of judging whether it being a selection signal for carrying out repeated regeneration of the sound-source data which are [ current ] under playback, or the sound-source data of arbitration if it is not a selection signal for stopping current playback actuation, and the signal which chooses; repeated regeneration The phase of judging whether it being the selection signal which it is going to reproduce at random irrespective of the preservation sequence of data; the sound reproduction approach using the MPEG method according to claim 7 characterized by including the phase of performing applicable actuation according to said each keying signal chosen.

[Claim 10] In the phase and; above in comparison with the reference value which had the electrical potential difference detected set up when the power-source condition of the current supply means detected from said process of operation was judged to be low power It is judged that it is the low power which cannot perform actuation by which the current supply means was stabilized. \*\*, In the phase and; above which intercept a power source after carrying out backup preservation of the current data stably, while displaying a power-source cutoff warning message The sound reproduction approach using the MPEG method according to claim 7 characterized by including the phase which displays the warning message which requires charge if the power of a current supply means is in the condition of extent that only minimum actuation may be performed.

[Claim 11] The sound reproduction approach using the MPEG method according to claim 7 characterized by detecting the power condition of a current supply means and advancing charge actuation, advancing playback actuation of sound-source data using an external power when supply of an external power is detected.

[Claim 12] The sound reproduction approach using the MPEG method according to claim 7 characterized by displaying the information over the sound-source data which are under

selected sound-source data and playback through LCD if the selection signal which requires playback from an information selection means is detected.

[Claim 13] In the phase and; above which judge whether the received data are searched and the error is included if it connects with external communication equipment and reception of data is advanced The process in which a re-transfer of data will be required if it is judged that the error is included in the received data; if an error is not detected by the received data The sound reproduction approach using the MPEG method according to claim 7 characterized by saving the received data by detection of the flag to the completion of data transmitting at the address address with which a data preservation means is specified.

## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the portable sound system and the sound reproduction approach using the MPEG method changes so that people can hear in more detail the sound-source data saved for the storage means by the MPEG (Moving Picture Experts Group) method with respect to a sound system and the sound reproduction approach, and it was made to output through headphone or a loudspeaker.

[0002]

[Description of the Prior Art] The data generally processed so that people can hear, and view and listen are reproduced through a regenerative apparatus, after being saved through a storage. For example, the data of an analog form are recorded on a magnetic tape, a magnetic tape, etc., and the data of a digital method are saved at a compact disk. The data which the data with which the data saved as mentioned above at the storage are saved at the regenerative apparatus, i.e., a magnetic tape, are reproduced by a cassette etc., and are saved at the compact disk are a CD player (Compact Disk Player). It is reproduced.

[0003] the digital technique which develops quickly recently -- personal computer (Personal Computer) the storage used -- large-capacity-izing and lightweight-izing -- it miniaturizes. However, the application program for managing efficiently the administration program for employing this and a user's business etc. came to face a limitation in large-capacity-izing and continuing large-capacity-izing a storage. This groped for various approaches, in order to use digital data efficiently, and the approach of maximizing the preservation effectiveness of a storage using the MPEG method which is the criterion of the high coding method of efficiency recently was developed. For example, if it saves at a storage after compressing data, such as a public song, a pop song, a classic, study data, other public relations, and guidance data, into an MPEG method using software or hardware Since the tone quality of data does not change but it increases compression preservation about 1 / 12 times, capacity of the digital data saved at a storage can be large-capacity-ized. On the contrary, in order to use the digital data by which compression preservation was carried out for a storage, after restoring to an MPEG method, it can change into the sound data which people can hear, and a public song, a pop song, a classic, etc. can be heard through headphone or a loudspeaker.

[0004]

[Problem(s) to be Solved by the Invention] Necessary [ of the same time amount ] carried out to the time amount which carries out necessary at playback recording [ which he wishes although the portable cassette offered as a means for carrying out playback listening of the data saved as mentioned above at the magnetic tape is provided with the function that it can perform recording / of sound-source data / wish / of music ], degradation generated at the time of sound recording, tone quality fell, and when it is repeated regeneration, the trouble that tone quality falls by the effect of a storage was. Furthermore, when the function to record sound-source data was not supported in the case of the CD player and there was an impact from the exterior by mechanical playback actuation, the bad influence was caused for playback actuation and there was a trouble that a life was shortened by the mechanical configuration. Moreover, since the storage which saves sound data, such as a magnetic tape and CD, was required for the portable cassette and the CD player, in order to keep the storage which occupies fixed space, special storage space was needed, and many problems were to keep a storage stably, without deforming and damaging. Moreover, the data saved by the MPEG method as mentioned above had the trouble that it had to submit to the expensive costs to installation of the hardware for the reconstitution-of-data playback compressed into the MPEG method, or software, when constraint of a location followed and a luggable computer was used only with locking devices, such as a personal computer, in order to carry out restoration listening of the data saved since restoration playback was possible. Moreover, when various sound-source data which a user is going to hear were saved at many storages, respectively, in order to reproduce the sound-source data which a user wishes to have, many storages had to be purchased, and there was a trouble that the storage needed for playback had to be exchanged each time. Moreover, in order to use new data, it caused inconvenient [ that a user had to purchase directly at the counter which sells the compact disk which is a storage, a magnetic tape, and a magnetic tape ].

[0005] This invention is for solving the above troubles, and after the purpose compresses the sound-source data of study or others into an MPEG method and saves them at the memory chip which is the storage means of a portable regenerative apparatus, it is to carry out restoration playback of the compressed data at the sound data which people can hear. Moreover, other purposes of this invention are by making it save at a semi-conductor storage to prevent degradation of the tone quality generated in process of preservation of data and storage, after compressing various sound-source data into an MPEG method. Moreover, as they provide backup preservation of new data with facilities and quickness as other purposes of this invention connect with a communication network or data selling equipment and can back up various data at high speed, and they can re-save the data by which backup preservation was carried out at the memory chip which is a storage means at their own personal computer, they are to provide preservation of the backed-up data with safety. Moreover, by not using a special storage, the miniaturization of pocket equipment and thin form-ization are made, and it is in eliminating constraint of space required for receipt storage of a storage.

[0006]

[Means for Solving the Problem] This invention for attaining the above purposes consists of a rechargeable battery about a sound system. The power source of said current supply means A current supply means to supply a power source [ required for a load ] of operation; A stable electrical potential difference, The power-source processing means

and; operating state which rectify on a current are embraced. A message A figure And the display means and; which are displayed in written form Preservation of the sound-source data of an MPEG method The general actuation to restoration playback A preservation means to save at the address address which has the sound-source data information of an MPEG method specified according to the signal impressed from the control means to control and the; aforementioned control means; the general actuation to the playback, backup, and employment of arbitration of sound-source data which were saved for said preservation means An information selection means to choose; it is characterized by including a transceiver means to be connected with the sound reproduction means and; external instrument which are changed so that people can hear the sound-source data saved for the preservation means according to the signal impressed from said control means, and to transmit and receive sound-source data and program data. This invention which has said description will perform playback of the saved sound-source data, and backup preservation of data by the selection signal of an information selection means, the power-source condition of operation, connection existence with an external power, connection existence with external communication equipment, etc., if loading of the main program is carried out, an execution environment is set up and a setup of an execution environment is completed, after initializing a system in the case of the current supply by the information selection means.

[0007] Moreover, in the sound system of this invention, when an external power source is impressed through an adapter, as for said power-source processing means, it is desirable to supply the charging current to the rechargeable battery of said current supply means.

[0008] In the sound system of this invention moreover, said information selection means Current music begins the forward switch which carries out rapid-traverse playback in continuing pushing on the following music 1 second or more, when pushing 1 or less second, and; 1 or less second push. To or former music If it pushes once, The reverse switch which carries out rewinding playback in continuing pushing; Playback, The safety switch with which it will stop and a power source will be shut off if it pushes again in the state of playback; if it pushes once, it is desirable one music iteration and to consist of a repetitive switch of which a repetitive setup will be canceled if it continues pushing whole repeatedly, and a random performance switch made to perform at random irrespective of the sequence of; music, if it pushes twice.

[0009] In the sound system of this invention moreover, said control means In termination of CPU (arithmetic and program control) which controls the actuation for changing the digital sound-source data saved in the MPEG method into the sound which people can hear, and; input/output operation, or the case of an I/O mistake The interrupter controller which outputs the control signal for controlling actuation of said CPU; The power source impressed from said power-source processing means is stably supplied to the power source of CPU of operation. In the case of error generating The keyboard interface which carries out interfacing of the key selection signal impressed from the; aforementioned information selection means to the power control machine which outputs the control signal for intercepting a power source; The current supplied to the row and column of said information-display means is controlled. For the LCD controller which controls the display embodiment of operating state,; program, or the escape of a memory area Connection of the extended ROM added The timer which counts a hour entry required for playback of the extended ROM interface and the backup actuation of; data which carry

out interfacing, and the backed-up data, and the interrupter of data required for systems operation; I/O of the data transmitted and received The controller to control; the control signal for controlling I/O of the digital sound data compressed into the flash plate ROM controller which activates the flash plate ROM of said preservation means according to the interrupter control signal impressed from said CPU, and; MPEG method It is desirable to consist of clock drives which process the DSP interface and; oscillation clock to output in the predetermined condition, and are driven to said CPU side as a clock signal.

[0010] Moreover, it is the volatile storage with which the information remembered that a power source is shut off in the sound system of this invention disappears, and it is the non-volatile storage with which the information which memorized even if the ram and; power source used as an extraordinary preservation location while the power source is impressed were shut off does not disappear, and digital sound-source data and program data are saved, and, as for said preservation means, it is desirable to consist of a flash plate ROM which can delete the saved data information.

[0011] Moreover, DSP which said sound reproduction means processes the digital sound-source data compressed into the MPEG method in the predetermined condition, and is restored in the sound system of this invention; it is desirable to consist of an audio circuit which changes into an electric acoustic signal the digital sound-source data restored by said DSP.

[0012] Moreover, another mode of this invention is the sound reproduction approach which used the MPEG method. If a setup of the process in which carry out loading of the main program and an execution environment is set up, and; execution environment is completed after initializing a system in the case of the current supply by said information selection means the selection signal of an information selection means, a power-source condition of operation, connection existence with an external power, and connection existence with external communication equipment -- it is characterized by including playback of the saved sound-source data, and the process in which backup preservation of data is performed, by how.

[0013] Moreover, if a main program will be performed, ipsefact will be set up, if the phase and; main program which detect whether there are any abnormalities in a main program are normal and abnormalities are in a main program in the sound reproduction approach of this invention after initializing CPU and a circumference circuit when a power source is impressed, while outputting an error signal, it is desirable to include further the phase of stopping activation actuation.

[0014] Moreover, it sets to the phase and; above which judge whether it is a signal for intercepting a power source of operation when actuation of arbitration is performed by the execution environment and the keying signal impressed from an information selection means is detected in the sound reproduction approach of this invention. In the phase and; above which will judge whether it is a playback selection signal if it is not a power-source cutoff signal In the phase and; above which judge whether it is a signal for choosing the data after the sound-source data by which current selection was made if it is not a playback selection signal In the phase and; above which judge whether it is a signal for choosing the sound-source data earlier data by which current selection was made if it is not the signal which chooses the data after the data by which current selection was made If it is not a signal for choosing the data earlier data by which current selection was made In the phase and; above which judge whether it is a selection signal for stopping the



playback actuation which is among a present progressive If it is not the phase of judging whether it being a selection signal for carrying out repeated regeneration of the sound-source data which are [ current ] under playback, or the sound-source data of arbitration if it is not a selection signal for stopping current playback actuation, and the signal which chooses; repeated regeneration The phase of judging whether it being the selection signal which it is going to reproduce at random irrespective of the preservation sequence of data; it is desirable to include the phase of performing applicable actuation according to said each keying signal chosen.

[0015] Moreover, if it is judged that the power-source condition of the current supply means detected from said process of operation is low power in the sound reproduction approach of this invention, it will set to the phase and; above in comparison with the reference value which had the electrical potential difference detected set up. It is judged that it is the low power which cannot perform actuation by which the current supply means was stabilized. \*\*, In the phase and; above which intercept a power source after carrying out backup preservation of the current data stably, while displaying a power-source cutoff warning message If the power of a current supply means is in the condition of extent that only minimum actuation may be performed, it is desirable to include the phase which displays the warning message which requires charge.

[0016] Moreover, in the sound reproduction approach of this invention, it is desirable to detect the power condition of a current supply means and to advance charge actuation, advancing playback actuation of sound-source data using an external power, when supply of an external power is detected.

[0017] Moreover, in the sound reproduction approach of this invention, when the selection signal which requires playback from an information selection means is detected, it is desirable to display the information over the sound-source data which are under selected sound-source data and playback through LCD.

[0018] Moreover, if it connects with external communication equipment and reception of data is advanced in the sound reproduction approach of this invention, will search the received data and it will set to the phase and; above which judge whether the error is included. The process in which a re-transfer of data will be required if it is judged that the error is included in the received data; if an error is not detected by the received data It is desirable to save the received data by detection of the flag to the completion of data transmitting at the address address with which a data preservation means is specified.

[0019]

[Embodiment of the Invention] It is as follows when the desirable operation gestalt of this invention is hereafter explained in detail based on the attached drawing. The portable sound system using the MPEG method by one example of this invention as shown in drawing 1 The current supply section 100, the power-source processing section 200, the information selection section 300, and the information-display section 400, It consists of a control section 500, the data preservation section 600, the sound reproduction section 700, and the transceiver section 800. The current supply section 100 Nickel-cadmium (nickel-Cd), a nickel hydrogen storage material (nickel-MH), It consists of rechargeable batteries, such as a lithium ion and a lithium-polymer, and a chemical energy is transformed into electric energy, each load is supplied as a power source of operation, and it is an adapter (Adapter). It charges, when it lets it pass and connects with an external power source.

[0020] Said power-source processing section 200 supplies the charging current to said current supply section 100, when the supply power source impressed from the outside through said current supply section 100 and adapter is rectified on a stable electrical-potential-difference current, each load is supplied as a drive power source and an external power source is connected through an adapter.

[0021] Said information selection section 300 consists of a predetermined function key, and outputs the electric signal over the execution control of control of current supply, the extract of the data which it is going to reproduce, and playback actuation, the transmit/receive control of data backup, etc. by a user's selection. The forward switch which it chooses the following music below fixed time amount when pushing said information selection section 300 1 or less second preferably, and fast forwards beyond fixed time amount in continuing pushing 1 second or more preferably, The reverse switch which rewinds in current music's beginning below fixed time amount in pushing 1 or less second preferably, or continuing pushing on former music, The playback/safety switch with which playback actuation will stop and a power source will be shut off if it pushes once and will push again in the state of playback and playback, If it pushes once, it consists of a random performance switch which will be performed at random irrespective of the repetitive switch of which one music iteration and the repetitive section set up when pushing 3 seconds or more preferably whole iteration and beyond still more fixed time amount are canceled, and the sequence of music if it pushes twice.

[0022] Said information-display section 400 consists of LCD (Liquid Crystal Display), and displays each message displayed according to operating state in a figure and an alphabetic character.

[0023] Said control section 500 saves the sound-source data compressed by the MPEG method, or outputs the control signal which controls the general actuation for carrying out restoration playback. CPU501 which controls the actuation for changing the digital sound-source data saved in the MPEG method into the sound which people can hear as said control section 500 is shown in drawing 2 , The interrupter controller 503 which outputs the control signal for controlling actuation of said CPU501 in the case of termination of input/output operation, or an I/O mistake, The power control machine 505 which outputs the control signal for supplying stably the power source impressed from said power-source processing section 200 as a power source of CPU501 of operation, and intercepting a power source at the time of error generating, The keyboard interface 507 which carries out interfacing of the key selection signal impressed from said information selection section 300, The LCD controller 509 which controls the current supplied to the row and column of said information-display section 400, and controls the display embodiment of operating state, The expanded memory interface 511 which carries out interfacing of the connection of the extended ROM and flash memory which are added for a program or the escape of a memory area, The timer 513 which counts a hour entry required for playback of backup actuation of data, and the backed-up data, the interrupter of data required for systems operation, etc., The bus bridge access-control machine 519 which outputs the control signal for controlling the bus to which data are transmitted, The controller 523 which controls I/O of the data transmitted and received, and the flash plate ROM controller 527 which activates flash plate ROM 603 according to the interrupter control signal impressed from CPU501, The DSP interface 529 which outputs the control signal for controlling I/O of the digital sound data compressed into the MPEG method, It

consists of clock drive 531 which processes the oscillation clock of an oscillator 1000 in the predetermined condition, and is driven to said CPU501 side as a clock signal.

[0024] Each aforementioned element is linked through an interrupter line and an input/output bus (I/O bus). The data preservation section 600 is a nonvolatile memory component for which the information memorized even if the power source was intercepted as the compression sound-source data of the MPEG method backed up through the transceiver section 800 were saved according to the signal impressed from said control section 500 and it was shown in drawing 2 does not disappear, and consists of flash plate ROM 603 which can save / delete digital data, such as sound-source data and an application program.

[0025] The sound reproduction section 700 is changed so that people can hear the sound data saved in said data preservation section 600 according to the signal impressed from said control section 500. Said sound-reproduction section 700 consists of the DSP section 701 which performs predetermined processing for restoring the digital sound-source data compressed into the MPEG method, and reproducing as shown in drawing 2 , the audio section 703 which change the signal impressed from said DSP section 701 into the excitation signal which people can hear, and headphone 705 which change the electric excitation signal impressed from said audio section 703 into the sound which a user can hear.

[0026] The transceiver section 800 is connected with external instruments, such as a common computer and a non-humanity news automatic selling means, transmits outside the sound source and program data which are saved in said data preservation section 600, or receives sound-source data and administration program data from an external instrument.

[0027] In this invention constituted by having the above functions, when the actuation for reproducing the digital sound-source data compressed into the MPEG method is explained based on drawing 3 - drawing 8 , it is as follows. as show in drawing 3 , if the electric power switch a user be prepare by the electric power switch in the information selection section 300 in order it carry out playback listening of the sound source data information of the arbitration of the digital sound source data by which compression preservation be carry out at an MPEG method at the data preservation section 600 be turn 'ON', a control section 500 go into a mode of operation by clock drive of the adapter power source of the current supply section 100 impress through the power source processing section 200, or the exterior, and an oscillator 1000 (the 1000th step : S 1000).

[0028] Henceforth, after CPU501 performs a main program and sets up ipsefact (the 1300th step: S1300), it detects the keying signal of the information selection section 300 impressed through a keyboard interface 507 and a MEM/IO bus (the 1400th step: S1400).

[0029] If the key input signal impressed from the information selection section 300 in said 1400th step is detected as shown in drawing 4 , it will judge whether it is a power-source 'OFF' selection signal for the keying signal detected to intercept the power source supplied from the power-source processing section 200 (the 1410th step: S1410).

[0030] If it is a power-source 'OFF' selection signal in said 1410th step, the power source of operation impressed from the power-source processing section 200 will be intercepted, and it will go into a standby mode (the 1415th step: S1415). If the keying signal chosen in said 1410th step is not a signal which is going to intercept a power source, it will judge whether it is a selection signal for carrying out restoration playback of the sound-source

data of the arbitration by which compression preservation is carried out to flash plate ROM 603 of the data preservation section 600 at an MPEG method (the 1420th step: S1420).

[0031] If the keying signal detected in said 1420th step is judged to be the keying signal which is going to reproduce the sound-source data of arbitration saved in the data preservation section 600 After CPU501 loads the sound-source data of the selected arbitration to the DSP section 701 through the DSP interface 529, The digital sound-source data compressed into the MPEG method by the administration program of the DSP section 701 are restored. It changes into an acoustic signal through the audio section 703, and playback actuation which changes and outputs the changed electric acoustic signal to the excitation signal which a user can hear through headphone or a loudspeaker 705 is performed (the 1425th step: S1425).

[0032] If it is not the signal chosen in order that the key selection signal detected in said 1420th step may reproduce the sound-source data of arbitration, it will judge whether it is a "forward" selection signal for choosing from whether current playback is carried out and selected sound-source data the sound-source data of arbitration saved to the field of a consecutive preservation address (the 1430th step: S1430). When it is detected that it is a "forward" selection signal in said 1420th step, CPU501 The program set up is followed. A forward selection signal Below fixed time amount If detected 1 or less second preferably, the following music will be chosen, playback actuation will be advanced, and beyond fixed time amount, if the selection signal of a "forward" is detected 1 second or more preferably, it will perform playback of the sound-source data by which current playback is carried out in quick actuation (the 1435th step: S1435).

[0033] It judges whether the key selection signal detected in said 1430th step is a "forward" "reverse" signal for choosing the sound-source data of arbitration saved in the saved area before whether current playback is carried out and selected sound-source data, if it is not a selection signal (the 1440th step: S1440).

[0034] If the keying signal detected in said 1440th step is detected as it is the signal which chooses "reverse" The program set up is followed. The selection signal of "reverse" Below fixed time amount If detected 1 or less second preferably, will carry out playback from the 1st syllable of current music, or playback actuation of former music is advanced. When a "reverse" selection signal is detected [ beyond fixed time amount ] continuously 1 second or more preferably, If the keying signal detected in said (the 1445th step: S1445) 1440th step which performs quickly sound-source data playback which is chosen with current reverse and reproduced is not a selection signal of "reverse" It judges whether it is a "halt" signal for stopping the playback actuation which is carrying out the present progressive temporarily (the 1450th step: S1450).

[0035] If the signal detected in said 1450th step is a "halt" signal for stopping current playback actuation The program set up is followed after analyzing the count of an input of "a halt" detected. Current playback actuation is stopped. a count predetermined in a stop signal -- it being detected once preferably, and, if current is playback operating state If current is a idle state, playback will be begun, and where playback actuation is stopped, a "halt" signal performs fixed time amount and actuation which will turn 'OFF' standby power for playback of sound-source data if it is detected continuously 3 seconds or more preferably (the 1455th step: S1455). If the keying signal detected in said 1450th step is not a "halt" selection signal, it will judge whether it is the signal of "iteration" chosen in

order to repeat the sound-source data by which current playback is carried out and to reproduce (the 1460th step: S1460).

[0036] When the keying signal detected in said 1460th step is judged to be the selection signal of "iteration" After the program which is having the count of an input of the selection signal detected set up analyzes, A "repetitive" selection signal carries out repeated regeneration of a predetermined count and the sound-source data which are carrying out current playback if detected once preferably. Repeat the whole sound-source data saved in the memory area of said flash plate ROM 603 if a "repetitive" selection signal is detected twice, and it reproduces. Actuation of which the repetitive section set up when the "repetitive" selection signal was detected, where the repeated regeneration section is set up is canceled is performed (the 1465th step: S1465). Moreover, if a "repetitive" selection signal is not detected in said 1460th step, it judges whether the signal which chooses a random performance is detected (the 1470th step: S1470).

[0037] If the signal which chooses a random performance in said 1470th step is detected, playback actuation will be performed at random (the 1475th step: S1475) and a random performance signal will not be detected irrespective of the saved sequence, actuation for reproducing the sound data compressed into the MPEG method according to the program set up is repeated and performed. As mentioned above, low power which cannot analyze power of the power source of operation impressed from the power-source processing section 200, and cannot perform playback actuation with the normal rechargeable battery electrical potential difference of the current supply section 100 in the condition that the sound-source data of arbitration are chosen according to the keying signal inputted from the information selection section 300, and playback actuation is advanced (Low Power) It judges whether it is a condition (the 1500th step: S1500).

[0038] If it is in the condition of the low power which cannot advance playback with the normal electrical potential difference of said current supply section 100 as shown in drawing 5 , it will detect whether below the fixed reference value, for example, an impossible electrical potential difference of operation, with which the present electrical potential difference detected was set up was reached (the 1510th step: S1510). If the electrical potential difference of the current supply section 100 detected as mentioned above is judged to be below the set-up fixed reference value, a control section 500 will output the predetermined control signal for displaying warning to the lack of a power source to the LCD controller 509 side through a MEM/IO bus.

[0039] With the control signal impressed, the LCD controller 509 adjusts the power supplied to the row and column of the information-display section 400 which consists of LCD, and displays a 'power-source cutoff' warning message (the 1520th step: S1520). To coincidence, through the flash plate ROM controller 527, CPU501 of a control section 500 impresses a data storage signal, saves a current condition at the flash plate ROM 603 side (the 1530th step: S1530), controls the power control machine 505 through a MEM/IO bus, and intercepts the current supply of the power-source processing section 200 to it (the 1540th step: S1540).

[0040] If it is judged that it is beyond a reference value with the fixed electrical potential difference of the current supply section 100 detected in said 1510th step, for example, the electrical potential difference which can operate at worst, a control section 500 will output the 'warning' message which controls the information-display section 400 which consists of LCD through the LCD controller 509, and receives insufficient [ power ] (the

1550th step: S1550).

[0041] As shown in drawing 6 , CPU501 of a control section 500 detects further whether an external power source is connected with the power-source processing section 200 through an adapter (the 1600th step: S1600). If the external power connection which let the adapter pass in said 1600th step is detected, the dc-battery condition of the current supply section 100 will be detected, and it will judge whether the dc-battery is maintaining the full charge condition (the 1610th step: S1610). If charge actuation is intercepted and the dc-battery is not maintaining the full charge condition in order to prevent breakage by excessive charge of a dc-battery, if it is in the condition that the dc-battery is maintaining the full charge condition in said 1610th step, it detects whether the power source of the exterior which let the adapter pass is supplied continuously (the 1620th step: S1620). If an external power source is continuously supplied in the condition that the dc-battery of the current supply section 100 is not maintaining the full charge, the power source of the exterior supplied will be made to flow into the current supply section 100 side, and the recharge of the dc-battery will be carried out (the 1630th step: S1630).

[0042] Moreover, if the sound-source data of arbitration are reproduced by playback actuation selection of said information selection section 300 and it will be detected as shown in drawing 7 (the 1700th step: S1700) CPU501 of a control section 500 lets the LCD controller 509 pass, after analyzing the data to the information over the sound-source data by which current playback is carried out, for example, the playback time amount of data, a title, a musical genre, residual playback time amount, etc. The analyzed playback information is displayed on the information-display section 400 which consists of LCD (the 1710th step: S1710).

[0043] Moreover, if CPU501 of a control section 500 accesses the digital sound-source data compressed into flash plate ROM 603 of the data preservation section 600 by the MPEG method and is transmitted to the DSP section 701 of the sound reproduction section 700 through the DSP interface 529 After processing the digital sound-source data compressed by the MPEG method in the predetermined condition and changing into an acoustic signal through the audio section 703, said DSP701 is reproduced so that a user can hear through headphone or a loudspeaker 705 (the 1720th step: S1720).

[0044] It judges whether the playback of sound-source data performed through the above actuation was completed (the 1730th step: S1730). The sound-source data reproduced next according to the signal which the user chose when the completion signal of playback was detected are searched from flash plate ROM 603 (the 1740th step; S1740). If retrieval is completed, loading of the sound-source data reproduced next will be carried out from flash plate ROM 603, and the preparations for playback will be made (the 1750th step: S1750).

[0045] On the other hand, CPU501 of a control section 500 analyzes the signal impressed from a controller 523, and detects whether the information automatic vending machine which sells the data and the programs of various classes, such as a computer by which the transceiver section 800 is equipped with communication link equipment of external communication equipment, for example, a modem etc., for backup of new sound-source data or music data, and a game, is connected (the 1800th step: S1800). And after going into data backup mode when connection of external communication equipment is detected by the transceiver section 800 in said 1800th step as shown in drawing 8 , it searches whether the various data transmitted are received (the 1810th step: S1810), and

the error is included in the backup data to receive (the 1820th step: S1820).

[0046] If it is judged that the error is included in said backup data to receive CPU501 of a control section 500 requires a re-transfer of data of external communication equipment through the transceiver section 800, and guides backup preservation of the normal data with which the error is not included (the 1830th step: S1830). If it is in the condition that the error is not included in the backup data to receive If it judges whether reception of the data for backup completed CPU501 (the 1840th step: S1840) and is judged as the completion of reception, the address field of the data preservation section 600 will be specified, and preservation of the received backup data will be completed (the 1850th step: S1850).

[0047]

[Effect of the Invention] As explained above, since this invention reproduces the sound-source data of arbitration alternatively by a user's selection after carrying out compression preservation of the sound-source data at the memory chip which is a semiconductor device at an MPEG method, use of storages, such as a record and a compact disk, is eliminated, use is provided with facilities and degradation of the sound-source data based on the inattention on sound recording and repetitive playback, and storage is eliminated. Moreover, since backup of new sound-source data is connected with external communication equipment and made with digital data, it is advanced irrespective of playback time amount at high speed, and since it can connect with external communication equipment and digital data can be transmitted and received, new data can be easily purchased through a network.

## TECHNICAL FIELD

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[Field of the Invention] This invention relates to the portable sound system and the sound reproduction approach using the MPEG method changes so that people can hear in more detail the sound-source data saved for the storage means by the MPEG (Moving Picture Experts Group) method with respect to a sound system and the sound reproduction approach, and it was made to output through headphone or a loudspeaker.

## PRIOR ART

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[Description of the Prior Art] The data generally processed so that people can hear, and view and listen are reproduced through a regenerative apparatus, after being saved through a storage. For example, the data of an analog form are recorded on a magnetic tape, a magnetic tape, etc., and the data of a digital method are saved at a compact disk. The data which the data with which the data saved as mentioned above at the storage are saved at the regenerative apparatus, i.e., a magnetic tape, are reproduced by a cassette etc., and are saved at the compact disk are a CD player (Compact Disk Player). It is reproduced.

[0003] the digital technique which develops quickly recently -- personal computer (Personal Computer) the storage used -- large-capacity-izing and lightweight-izing -- it miniaturizes. However, the application program for managing efficiently the administration program for employing this and a user's business etc. came to face a limitation in large-capacity-izing and continuing large-capacity-izing a storage. This

groped for various approaches, in order to use digital data efficiently, and the approach of maximizing the preservation effectiveness of a storage using the MPEG method which is the criterion of the high coding method of efficiency recently was developed. For example, if it saves at a storage after compressing data, such as a public song, a pop song, a classic, study data, other public relations, and guidance data, into an MPEG method using software or hardware Since the tone quality of data does not change but it increases compression preservation about 1 / 12 times, capacity of the digital data saved at a storage can be large-capacity-ized. On the contrary, in order to use the digital data by which compression preservation was carried out for a storage, after restoring to an MPEG method, it can change into the sound data which people can hear, and a public song, a pop song, a classic, etc. can be heard through headphone or a loudspeaker.

## **EFFECT OF THE INVENTION**

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[Effect of the Invention] As explained above, since this invention reproduces the sound-source data of arbitration alternatively by a user's selection after carrying out compression preservation of the sound-source data at the memory chip which is a semiconductor device at an MPEG method, use of storages, such as a record and a compact disk, is eliminated, use is provided with facilities and degradation of the sound-source data based on the inattention on sound recording and repetitive playback, and storage is eliminated. Moreover, since backup of new sound-source data is connected with external communication equipment and made with digital data, it is advanced irrespective of playback time amount at high speed, and since it can connect with external communication equipment and digital data can be transmitted and received, new data can be easily purchased through a network.

## **TECHNICAL PROBLEM**

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[Problem(s) to be Solved by the Invention] Necessary [ of the same time amount ] carried out to the time amount which carries out necessary at playback recording [ which he wishes although the portable cassette offered as a means for carrying out playback listening of the data saved as mentioned above at the magnetic tape is provided with the function that it can perform recording / of sound-source data / wish / of music ], degradation generated at the time of sound recording, tone quality fell, and when it is repeated regeneration, the trouble that tone quality falls by the effect of a storage was. Furthermore, when the function to record sound-source data was not supported in the case of the CD player and there was an impact from the exterior by mechanical playback actuation, the bad influence was caused for playback actuation and there was a trouble that a life was shortened by the mechanical configuration. Moreover, since the storage which saves sound data, such as a magnetic tape and CD, was required for the portable cassette and the CD player, in order to keep the storage which occupies fixed space, special storage space was needed, and many problems were to keep a storage stably, without deforming and damaging. Moreover, the data saved by the MPEG method as mentioned above had the trouble that it had to submit to the expensive costs to installation of the hardware for the reconstitution-of-data playback compressed into the MPEG method, or software, when constraint of a location followed and a luggable



computer was used only with locking devices, such as a personal computer, in order to carry out restoration listening of the data saved since restoration playback was possible. Moreover, when various sound-source data which a user is going to hear were saved at many storages, respectively, in order to reproduce the sound-source data which a user wishes to have, many storages had to be purchased, and there was a trouble that the storage needed for playback had to be exchanged each time. Moreover, in order to use new data, it caused inconvenient [ that a user had to purchase directly at the counter which sells the compact disk which is a storage, a magnetic tape, and a magnetic tape ].

[0005] This invention is for solving the above troubles, and after the purpose compresses the sound-source data of study or others into an MPEG method and saves them at the memory chip which is the storage means of a portable regenerative apparatus, it is to carry out restoration playback of the compressed data at the sound data which people can hear. Moreover, other purposes of this invention are by making it save at a semi-conductor storage to prevent degradation of the tone quality generated in process of preservation of data and storage, after compressing various sound-source data into an MPEG method. Moreover, as they provide backup preservation of new data with facilities and quickness as other purposes of this invention connect with a communication network or data selling equipment and can back up various data at high speed, and they can re-save the data by which backup preservation was carried out at the memory chip which is a storage means at their own personal computer, they are to provide preservation of the backed-up data with safety. Moreover, by not using a special storage, the miniaturization of pocket equipment and thin form-ization are made, and it is in eliminating constraint of space required for receipt storage of a storage.

## MEANS

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[Means for Solving the Problem] This invention for attaining the above purposes consists of a rechargeable battery about a sound system. The power source of said current supply means A current supply means to supply a power source [ required for a load ] of operation; A stable electrical potential difference, The power-source processing means and; operating state which rectify on a current are embraced. A message A figure And the display means and; which are displayed in written form Preservation of the sound-source data of an MPEG method The general actuation to restoration playback A preservation means to save at the address address which has the sound-source data information of an MPEG method specified according to the signal impressed from the control means to control and the; aforementioned control means; the general actuation to the playback, backup, and employment of arbitration of sound-source data which were saved for said preservation means An information selection means to choose; it is characterized by including a transceiver means to be connected with the sound reproduction means and; external instrument which are changed so that people can hear the sound-source data saved for the preservation means according to the signal impressed from said control means, and to transmit and receive sound-source data and program data. This invention which has said description will perform playback of the saved sound-source data, and backup preservation of data by the selection signal of an information selection means, the power-source condition of operation, connection existence with an external power,

connection existence with external communication equipment, etc., if loading of the main program is carried out, an execution environment is set up and a setup of an execution environment is completed, after initializing a system in the case of the current supply by the information selection means.

[0007] Moreover, in the sound system of this invention, when an external power source is impressed through an adapter, as for said power-source processing means, it is desirable to supply the charging current to the rechargeable battery of said current supply means.

[0008] In the sound system of this invention moreover, said information selection means Current music begins the forward switch which carries out rapid-traverse playback in continuing pushing on the following music 1 second or more, when pushing 1 or less second, and; 1 or less second push. To or former music If it pushes once, The reverse switch which carries out rewinding playback in continuing pushing; Playback, The safety switch with which it will stop and a power source will be shut off if it pushes again in the state of playback; if it pushes once, it is desirable one music iteration and to consist of a repetitive switch of which a repetitive setup will be canceled if it continues pushing whole repeatedly, and a random performance switch made to perform at random irrespective of the sequence of; music, if it pushes twice.

[0009] In the sound system of this invention moreover, said control means In termination of CPU (arithmetic and program control) which controls the actuation for changing the digital sound-source data saved in the MPEG method into the sound which people can hear, and; input/output operation, or the case of an I/O mistake The interrupter controller which outputs the control signal for controlling actuation of said CPU; The power source impressed from said power-source processing means is stably supplied to the power source of CPU of operation. In the case of error generating The keyboard interface which carries out interfacing of the key selection signal impressed from the; aforementioned information selection means to the power control machine which outputs the control signal for intercepting a power source; The current supplied to the row and column of said information-display means is controlled. For the LCD controller which controls the display embodiment of operating state,; program, or the escape of a memory area Connection of the extended ROM added The timer which counts a hour entry required for playback of the extended ROM interface and the backup actuation of; data which carry out interfacing, and the backed-up data, and the interrupter of data required for systems operation; I/O of the data transmitted and received The controller to control; the control signal for controlling I/O of the digital sound data compressed into the flash plate ROM controller which activates the flash plate ROM of said preservation means according to the interrupter control signal impressed from said CPU, and;MPEG method It is desirable to consist of clock drives which process the DSP interface and; oscillation clock to output in the predetermined condition, and are driven to said CPU side as a clock signal.

[0010] Moreover, it is the volatile storage with which the information remembered that a power source is shut off in the sound system of this invention disappears, and it is the non-volatile storage with which the information which memorized even if the ram and; power source used as an extraordinary preservation location while the power source is impressed were shut off does not disappear, and digital sound-source data and program data are saved, and, as for said preservation means, it is desirable to consist of a flash plate ROM which can delete the saved data information.

[0011] Moreover, DSP which said sound reproduction means processes the digital sound-

source data compressed into the MPEG method in the predetermined condition, and is restored in the sound system of this invention; it is desirable to consist of an audio circuit which changes into an electric acoustic signal the digital sound-source data restored by said DSP.

[0012] Moreover, another mode of this invention is the sound reproduction approach which used the MPEG method. If a setup of the process in which carry out loading of the main program and an execution environment is set up, and; execution environment is completed after initializing a system in the case of the current supply by said information selection means the selection signal of an information selection means, a power-source condition of operation, connection existence with an external power, and connection existence with external communication equipment -- it is characterized by including playback of the saved sound-source data, and the process in which backup preservation of data is performed, by how.

[0013] Moreover, if a main program will be performed, ipsefact will be set up, if the phase and; main program which detect whether there are any abnormalities in a main program are normal and abnormalities are in a main program in the sound reproduction approach of this invention after initializing CPU and a circumference circuit when a power source is impressed, while outputting an error signal, it is desirable to include further the phase of stopping activation actuation.

[0014] Moreover, it sets to the phase and; above which judge whether it is a signal for intercepting a power source of operation when actuation of arbitration is performed by the execution environment and the keying signal impressed from an information selection means is detected in the sound reproduction approach of this invention. In the phase and; above which will judge whether it is a playback selection signal if it is not a power-source cutoff signal In the phase and; above which judge whether it is a signal for choosing the data after the sound-source data by which current selection was made if it is not a playback selection signal In the phase and; above which judge whether it is a signal for choosing the sound-source data earlier data by which current selection was made if it is not the signal which chooses the data after the data by which current selection was made If it is not a signal for choosing the data earlier data by which current selection was made In the phase and; above which judge whether it is a selection signal for stopping the playback actuation which is among a present progressive If it is not the phase of judging whether it being a selection signal for carrying out repeated regeneration of the sound-source data which are [ current ] under playback, or the sound-source data of arbitration if it is not a selection signal for stopping current playback actuation, and the signal which chooses; repeated regeneration The phase of judging whether it being the selection signal which it is going to reproduce at random irrespective of the preservation sequence of data; it is desirable to include the phase of performing applicable actuation according to said each keying signal chosen.

[0015] Moreover, if it is judged that the power-source condition of the current supply means detected from said process of operation is low power in the sound reproduction approach of this invention, it will set to the phase and; above in comparison with the reference value which had the electrical potential difference detected set up. It is judged that it is the low power which cannot perform actuation by which the current supply means was stabilized. \*\*, In the phase and; above which intercept a power source after carrying out backup preservation of the current data stably, while displaying a power-

source cutoff warning message If the power of a current supply means is in the condition of extent that only minimum actuation may be performed, it is desirable to include the phase which displays the warning message which requires charge.

[0016] Moreover, in the sound reproduction approach of this invention, it is desirable to detect the power condition of a current supply means and to advance charge actuation, advancing playback actuation of sound-source data using an external power, when supply of an external power is detected.

[0017] Moreover, in the sound reproduction approach of this invention, when the selection signal which requires playback from an information selection means is detected, it is desirable to display the information over the sound-source data which are under selected sound-source data and playback through LCD.

[0018] Moreover, if it connects with external communication equipment and reception of data is advanced in the sound reproduction approach of this invention, will search the received data and it will set to the phase and; above which judge whether the error is included. The process in which a re-transfer of data will be required if it is judged that the error is included in the received data; if an error is not detected by the received data It is desirable to save the received data by detection of the flag to the completion of data transmitting at the address address with which a data preservation means is specified.

[0019]

[Embodiment of the Invention] It is as follows when the desirable operation gestalt of this invention is hereafter explained in detail based on the attached drawing. The portable sound system using the MPEG method by one example of this invention as shown in drawing 1 The current supply section 100, the power-source processing section 200, the information selection section 300, and the information-display section 400, It consists of a control section 500, the data preservation section 600, the sound reproduction section 700, and the transceiver section 800. The current supply section 100 Nickel-cadmium (nickel-Cd), a nickel hydrogen storage material (nickel-MH), It consists of rechargeable batteries, such as a lithium ion and a lithium-polymer, and a chemical energy is transformed into electric energy, each load is supplied as a power source of operation, and it is an adapter (Adapter). It charges, when it lets it pass and connects with an external power source.

[0020] Said power-source processing section 200 supplies the charging current to said current supply section 100, when the supply power source impressed from the outside through said current supply section 100 and adapter is rectified on a stable electrical-potential-difference current, each load is supplied as a drive power source and an external power source is connected through an adapter.

[0021] Said information selection section 300 consists of a predetermined function key, and outputs the electric signal over the execution control of control of current supply, the extract of the data which it is going to reproduce, and playback actuation, the transmit/receive control of data backup, etc. by a user's selection. The forward switch which it chooses the following music below fixed time amount when pushing said information selection section 300 1 or less second preferably, and fast forwards beyond fixed time amount in continuing pushing 1 second or more preferably, The reverse switch which rewinds in current music's beginning below fixed time amount in pushing 1 or less second preferably, or continuing pushing on former music, The playback/safety switch with which playback actuation will stop and a power source will be shut off if it pushes

once and will push again in the state of playback and playback, If it pushes once, it consists of a random performance switch which will be performed at random irrespective of the repetitive switch of which one music iteration and the repetitive section set up when pushing 3 seconds or more preferably whole iteration and beyond still more fixed time amount are canceled, and the sequence of music if it pushes twice.

[0022] Said information-display section 400 consists of LCD (Liquid Crystal Display), and displays each message displayed according to operating state in a figure and an alphabetic character.

[0023] Said control section 500 saves the sound-source data compressed by the MPEG method, or outputs the control signal which controls the general actuation for carrying out restoration playback. CPU501 which controls the actuation for changing the digital sound-source data saved in the MPEG method into the sound which people can hear as said control section 500 is shown in drawing 2 , The interrupter controller 503 which outputs the control signal for controlling actuation of said CPU501 in the case of termination of input/output operation, or an I/O mistake, The power control machine 505 which outputs the control signal for supplying stably the power source impressed from said power-source processing section 200 as a power source of CPU501 of operation, and intercepting a power source at the time of error generating, The keyboard interface 507 which carries out interfacing of the key selection signal impressed from said information selection section 300, The LCD controller 509 which controls the current supplied to the row and column of said information-display section 400, and controls the display embodiment of operating state, The expanded memory interface 511 which carries out interfacing of the connection of the extended ROM and flash memory which are added for a program or the escape of a memory area, The timer 513 which counts a hour entry required for playback of backup actuation of data, and the backed-up data, the interrupter of data required for systems operation, etc., The bus bridge access-control machine 519 which outputs the control signal for controlling the bus to which data are transmitted, The controller 523 which controls I/O of the data transmitted and received, and the flash plate ROM controller 527 which activates flash plate ROM 603 according to the interrupter control signal impressed from CPU501, The DSP interface 529 which outputs the control signal for controlling I/O of the digital sound data compressed into the MPEG method, It consists of clock drive 531 which processes the oscillation clock of an oscillator 1000 in the predetermined condition, and is driven to said CPU501 side as a clock signal.

[0024] Each aforementioned element is linked through an interrupter line and an input/output bus (I/O bus). The data preservation section 600 is a nonvolatile memory component for which the information memorized even if the power source was intercepted as the compression sound-source data of the MPEG method backed up through the transceiver section 800 were saved according to the signal impressed from said control section 500 and it was shown in drawing 2 does not disappear, and consists of flash plate ROM 603 which can save / delete digital data, such as sound-source data and an application program.

[0025] The sound reproduction section 700 is changed so that people can hear the sound data saved in said data preservation section 600 according to the signal impressed from said control section 500. Said sound-reproduction section 700 consists of the DSP section 701 which performs predetermined processing for restoring the digital sound-source data compressed into the MPEG method, and reproducing as shown in drawing 2 , the audio

section 703 which change the signal impressed from said DSP section 701 into the excitation signal which people can hear, and headphone 705 which change the electric excitation signal impressed from said audio section 703 into the sound which a user can hear.

[0026] The transceiver section 800 is connected with external instruments, such as a common computer and a non-humanity news automatic selling means, transmits outside the sound source and program data which are saved in said data preservation section 600, or receives sound-source data and administration program data from an external instrument.

[0027] In this invention constituted by having the above functions, when the actuation for reproducing the digital sound-source data compressed into the MPEG method is explained based on drawing 3 - drawing 8, it is as follows. as show in drawing 3, if the electric power switch a user be prepare by the electric power switch in the information selection section 300 in order it carry out playback listening of the sound source data information of the arbitration of the digital sound source data by which compression preservation be carry out at an MPEG method at the data preservation section 600 be turn 'ON', a control section 500 go into a mode of operation by clock drive of the adapter power source of the current supply section 100 impress through the power source processing section 200, or the exterior, and an oscillator 1000 (the 1000th step : S 1000).

[0028] Henceforth, after CPU501 performs a main program and sets up ipsefact (the 1300th step: S1300), it detects the keying signal of the information selection section 300 impressed through a keyboard interface 507 and a MEM/IO bus (the 1400th step: S1400).

[0029] If the key input signal impressed from the information selection section 300 in said 1400th step is detected as shown in drawing 4, it will judge whether it is a power-source 'OFF' selection signal for the keying signal detected to intercept the power source supplied from the power-source processing section 200 (the 1410th step: S1410).

[0030] If it is a power-source 'OFF' selection signal in said 1410th step, the power source of operation impressed from the power-source processing section 200 will be intercepted, and it will go into a standby mode (the 1415th step: S1415). If the keying signal chosen in said 1410th step is not a signal which is going to intercept a power source, it will judge whether it is a selection signal for carrying out restoration playback of the sound-source data of the arbitration by which compression preservation is carried out to flash plate ROM 603 of the data preservation section 600 at an MPEG method (the 1420th step: S1420).

[0031] If the keying signal detected in said 1420th step is judged to be the keying signal which is going to reproduce the sound-source data of arbitration saved in the data preservation section 600 After CPU501 loads the sound-source data of the selected arbitration to the DSP section 701 through the DSP interface 529, The digital sound-source data compressed into the MPEG method by the administration program of the DSP section 701 are restored. It changes into an acoustic signal through the audio section 703, and playback actuation which changes and outputs the changed electric acoustic signal to the excitation signal which a user can hear through headphone or a loudspeaker 705 is performed (the 1425th step: S1425).

[0032] If it is not the signal chosen in order that the key selection signal detected in said 1420th step may reproduce the sound-source data of arbitration, it will judge whether it is a "forward" selection signal for choosing from whether current playback is carried out

and selected sound-source data the sound-source data of arbitration saved to the field of a consecutive preservation address (the 1430th step: S1430). When it is detected that it is a "forward" selection signal in said 1420th step, CPU501 The program set up is followed. A forward selection signal Below fixed time amount If detected 1 or less second preferably, the following music will be chosen, playback actuation will be advanced, and beyond fixed time amount, if the selection signal of a "forward" is detected 1 second or more preferably, it will perform playback of the sound-source data by which current playback is carried out in quick actuation (the 1435th step: S1435).

[0033] It judges whether the key selection signal detected in said 1430th step is a "forward" "reverse" signal for choosing the sound-source data of arbitration saved in the saved area before whether current playback is carried out and selected sound-source data, if it is not a selection signal (the 1440th step: S1440).

[0034] If the keying signal detected in said 1440th step is detected as it is the signal which chooses "reverse" The program set up is followed. The selection signal of "reverse" Below fixed time amount If detected 1 or less second preferably, will carry out playback from the 1st syllable of current music, or playback actuation of former music is advanced. When a "reverse" selection signal is detected [ beyond fixed time amount ] continuously 1 second or more preferably, If the keying signal detected in said (the 1445th step: S1445) 1440th step which performs quickly sound-source data playback which is chosen with current reverse and reproduced is not a selection signal of "reverse" It judges whether it is a "halt" signal for stopping the playback actuation which is carrying out the present progressive temporarily (the 1450th step: S1450).

[0035] If the signal detected in said 1450th step is a "halt" signal for stopping current playback actuation The program set up is followed after analyzing the count of an input of "a halt" detected. Current playback actuation is stopped. a count predetermined in a stop signal -- it being detected once preferably, and, if current is playback operating state If current is a idle state, playback will be begun, and where playback actuation is stopped, a "halt" signal performs fixed time amount and actuation which will turn 'OFF' standby power for playback of sound-source data if it is detected continuously 3 seconds or more preferably (the 1455th step: S1455). If the keying signal detected in said 1450th step is not a "halt" selection signal, it will judge whether it is the signal of "iteration" chosen in order to repeat the sound-source data by which current playback is carried out and to reproduce (the 1460th step: S1460).

[0036] When the keying signal detected in said 1460th step is judged to be the selection signal of "iteration" After the program which is having the count of an input of the selection signal detected set up analyzes, A "repetitive" selection signal carries out repeated regeneration of a predetermined count and the sound-source data which are carrying out current playback if detected once preferably. Repeat the whole sound-source data saved in the memory area of said flash plate ROM 603 if a "repetitive" selection signal is detected twice, and it reproduces. Actuation of which the repetitive section set up when the "repetitive" selection signal was detected, where the repeated regeneration section is set up is canceled is performed (the 1465th step: S1465). Moreover, if a "repetitive" selection signal is not detected in said 1460th step, it judges whether the signal which chooses a random performance is detected (the 1470th step: S1470).

[0037] If the signal which chooses a random performance in said 1470th step is detected, playback actuation will be performed at random (the 1475th step: S1475) and a random

performance signal will not be detected irrespective of the saved sequence, actuation for reproducing the sound data compressed into the MPEG method according to the program set up is repeated and performed. As mentioned above, low power which cannot analyze power of the power source of operation impressed from the power-source processing section 200, and cannot perform playback actuation with the normal rechargeable battery electrical potential difference of the current supply section 100 in the condition that the sound-source data of arbitration are chosen according to the keying signal inputted from the information selection section 300, and playback actuation is advanced (Low Power) It judges whether it is a condition (the 1500th step: S1500).

[0038] If it is in the condition of the low power which cannot advance playback with the normal electrical potential difference of said current supply section 100 as shown in drawing 5 , it will detect whether below the fixed reference value, for example, an impossible electrical potential difference of operation, with which the present electrical potential difference detected was set up was reached (the 1510th step: S1510). If the electrical potential difference of the current supply section 100 detected as mentioned above is judged to be below the set-up fixed reference value, a control section 500 will output the predetermined control signal for displaying warning to the lack of a power source to the LCD controller 509 side through a MEM/IO bus.

[0039] With the control signal impressed, the LCD controller 509 adjusts the power supplied to the row and column of the information-display section 400 which consists of LCD, and displays a 'power-source cutoff' warning message (the 1520th step: S1520). To coincidence, through the flash plate ROM controller 527, CPU501 of a control section 500 impresses a data storage signal, saves a current condition at the flash plate ROM 603 side (the 1530th step: S1530), controls the power control machine 505 through a MEM/IO bus, and intercepts the current supply of the power-source processing section 200 to it (the 1540th step: S1540).

[0040] If it is judged that it is beyond a reference value with the fixed electrical potential difference of the current supply section 100 detected in said 1510th step, for example, the electrical potential difference which can operate at worst, a control section 500 will output the 'warning' message which controls the information-display section 400 which consists of LCD through the LCD controller 509, and receives insufficient [ power ] (the 1550th step: S1550).

[0041] As shown in drawing 6 , CPU501 of a control section 500 detects further whether an external power source is connected with the power-source processing section 200 through an adapter (the 1600th step: S1600). If the external power connection which let the adapter pass in said 1600th step is detected, the dc-battery condition of the current supply section 100 will be detected, and it will judge whether the dc-battery is maintaining the full charge condition (the 1610th step: S1610). If charge actuation is intercepted and the dc-battery is not maintaining the full charge condition in order to prevent breakage by excessive charge of a dc-battery, if it is in the condition that the dc-battery is maintaining the full charge condition in said 1610th step, it detects whether the power source of the exterior which let the adapter pass is supplied continuously (the 1620th step: S1620). If an external power source is continuously supplied in the condition that the dc-battery of the current supply section 100 is not maintaining the full charge, the power source of the exterior supplied will be made to flow into the current supply section 100 side, and the recharge of the dc-battery will be carried out (the 1630th step: S1630).



[0042] Moreover, if the sound-source data of arbitration are reproduced by playback actuation selection of said information selection section 300 and it will be detected as shown in drawing 7 (the 1700th step: S1700) CPU501 of a control section 500 lets the LCD controller 509 pass, after analyzing the data to the information over the sound-source data by which current playback is carried out, for example, the playback time amount of data, a title, a musical genre, residual playback time amount, etc. The analyzed playback information is displayed on the information-display section 400 which consists of LCD (the 1710th step: S1710).

[0043] Moreover, if CPU501 of a control section 500 accesses the digital sound-source data compressed into flash plate ROM 603 of the data preservation section 600 by the MPEG method and is transmitted to the DSP section 701 of the sound reproduction section 700 through the DSP interface 529 After processing the digital sound-source data compressed by the MPEG method in the predetermined condition and changing into an acoustic signal through the audio section 703, said DSP701 is reproduced so that a user can hear through headphone or a loudspeaker 705 (the 1720th step: S1720).

[0044] It judges whether the playback of sound-source data performed through the above actuation was completed (the 1730th step: S1730). The sound-source data reproduced next according to the signal which the user chose when the completion signal of playback was detected are searched from flash plate ROM 603 (the 1740th step; S1740). If retrieval is completed, loading of the sound-source data reproduced next will be carried out from flash plate ROM 603, and the preparations for playback will be made (the 1750th step: S1750).

[0045] On the other hand, CPU501 of a control section 500 analyzes the signal impressed from a controller 523, and detects whether the information automatic vending machine which sells the data and the programs of various classes, such as a computer by which the transceiver section 800 is equipped with communication link equipment of external communication equipment, for example, a modem etc., for backup of new sound-source data or music data, and a game, is connected (the 1800th step: S1800). And after going into data backup mode when connection of external communication equipment is detected by the transceiver section 800 in said 1800th step as shown in drawing 8 , it searches whether the various data transmitted are received (the 1810th step: S1810), and the error is included in the backup data to receive (the 1820th step: S1820).

[0046] If it is judged that the error is included in said backup data to receive CPU501 of a control section 500 requires a re-transfer of data of external communication equipment through the transceiver section 800, and guides backup preservation of the normal data with which the error is not included (the 1830th step: S1830). If it is in the condition that the error is not included in the backup data to receive If it judges whether reception of the data for backup completed CPU501 (the 1840th step: S1840) and is judged as the completion of reception, the address field of the data preservation section 600 will be specified, and preservation of the received backup data will be completed (the 1850th step: S1850).

## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the configuration block Fig. showing the portable sound system using

the MPEG method by this invention.

[Drawing 2] It is the detail configuration block Fig. showing the control section in this invention of drawing 1 .

[Drawing 3] It is the sequence Fig. of the portable sound system using the MPEG method by this invention of operation (the 1).

[Drawing 4] It is the sequence Fig. of the portable sound system using the MPEG method by this invention of operation (the 2).

[Drawing 5] It is the sequence Fig. of the portable sound system using the MPEG method by this invention of operation (the 3).

[Drawing 6] It is the sequence Fig. of the portable sound system using the MPEG method by this invention of operation (the 4).

[Drawing 7] It is the sequence Fig. of the portable sound system using the MPEG method by this invention of operation (the 5).

[Drawing 8] It is the sequence Fig. of the portable sound system using the MPEG method by this invention of operation (the 6).

[Description of Notations]

100 Current Supply Section

200 Power-Source Processing Section

300 Information Selection Section

400 Information-Display Section

500 Control Section

501 CPU

503 Interrupter Controller

505 Power Control Machine

507 Keyboard Interface

509 LCD Controller

511 Expanded Memory Interface

513 Timer

519 Bus Bridge Access-Control Machine

523 Controller

527 Flash Plate ROM Controller

529 DSP Interface

531 Clock Drive

600 Data Preservation Section

603 Flash Plate ROM

700 Sound Reproduction Section

701 The DSP Section

703 Audio Section

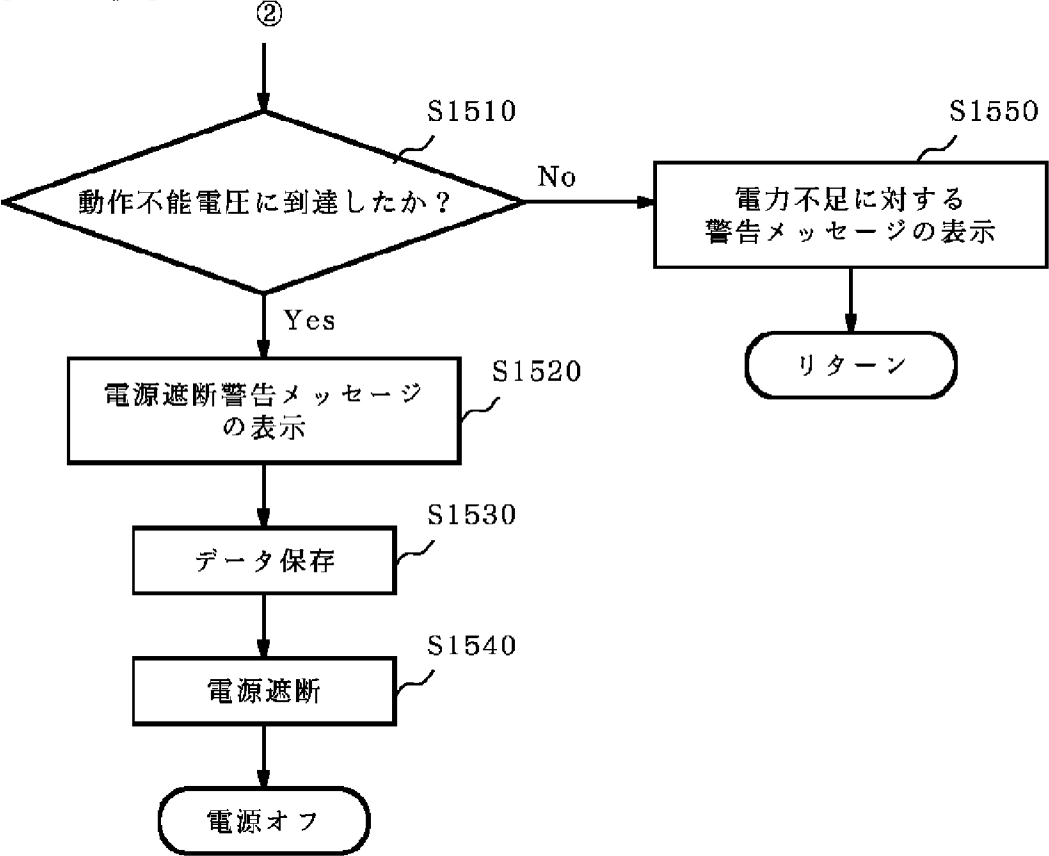
705 Headphone

800 Transceiver Section

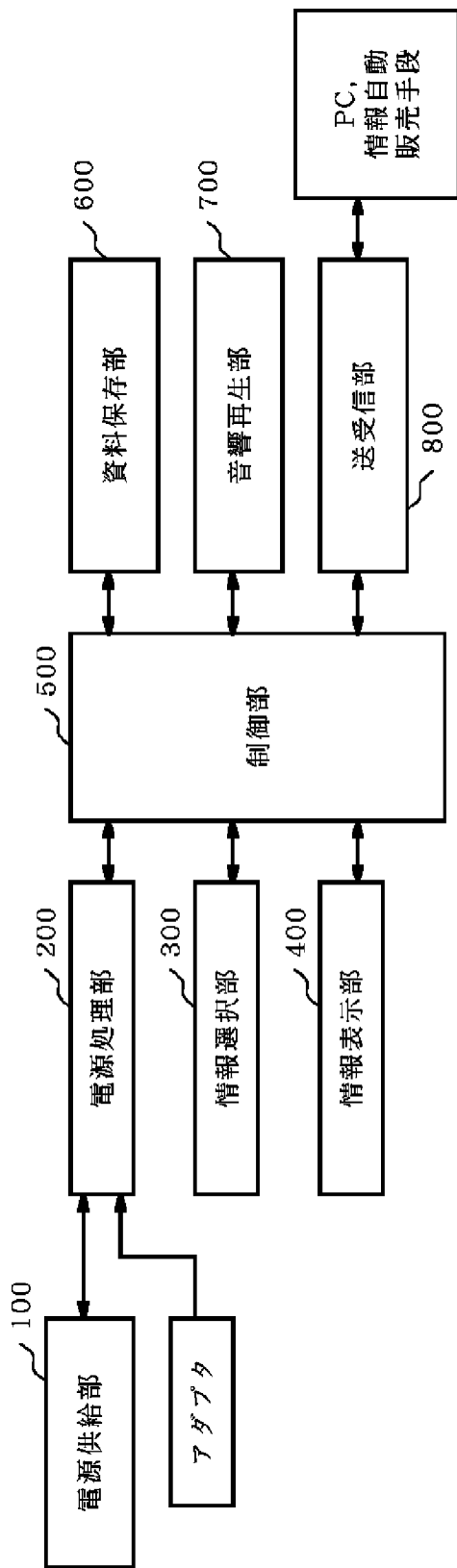
1000 Oscillator

DRAWINGS

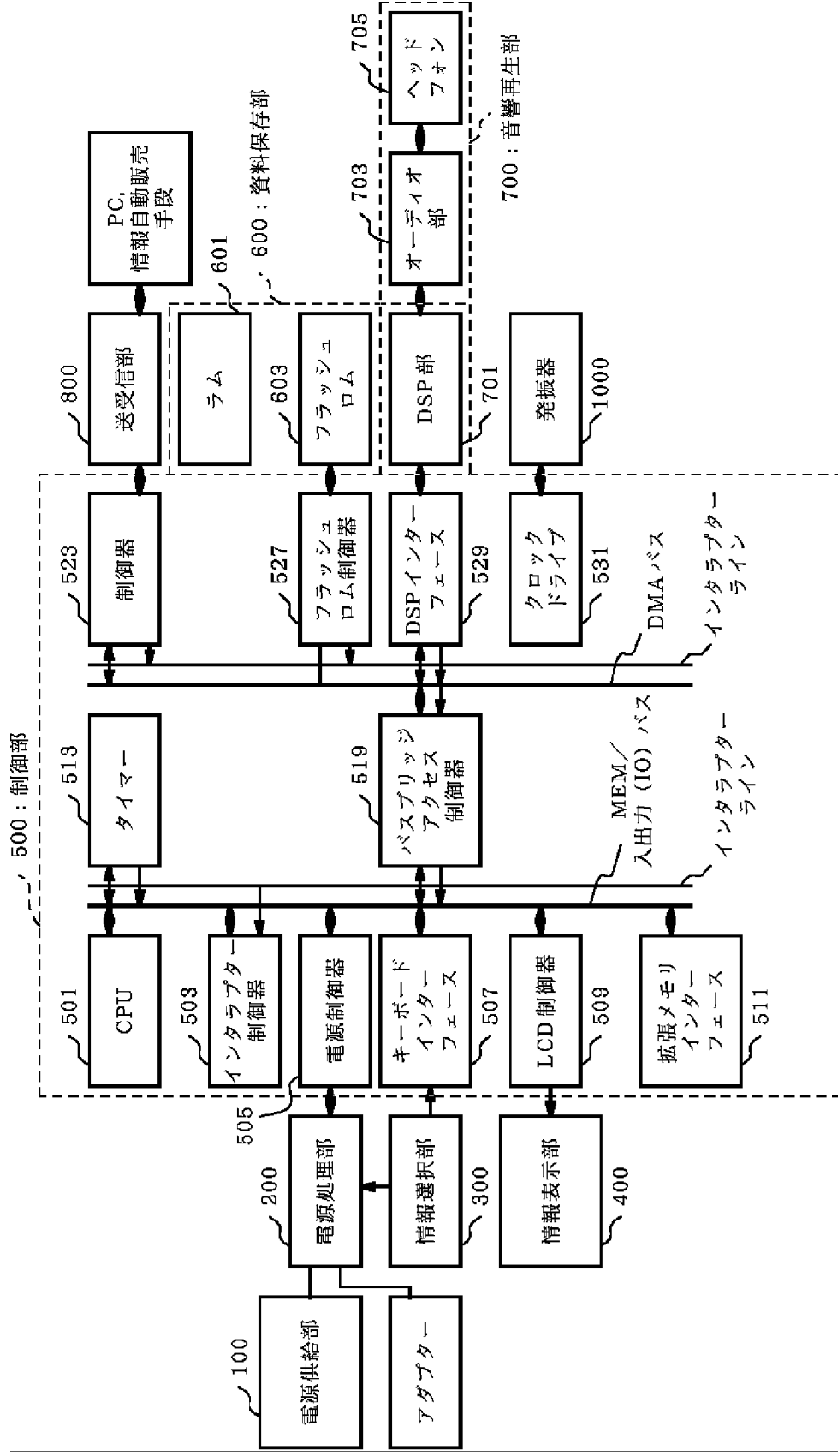
[Drawing 5]



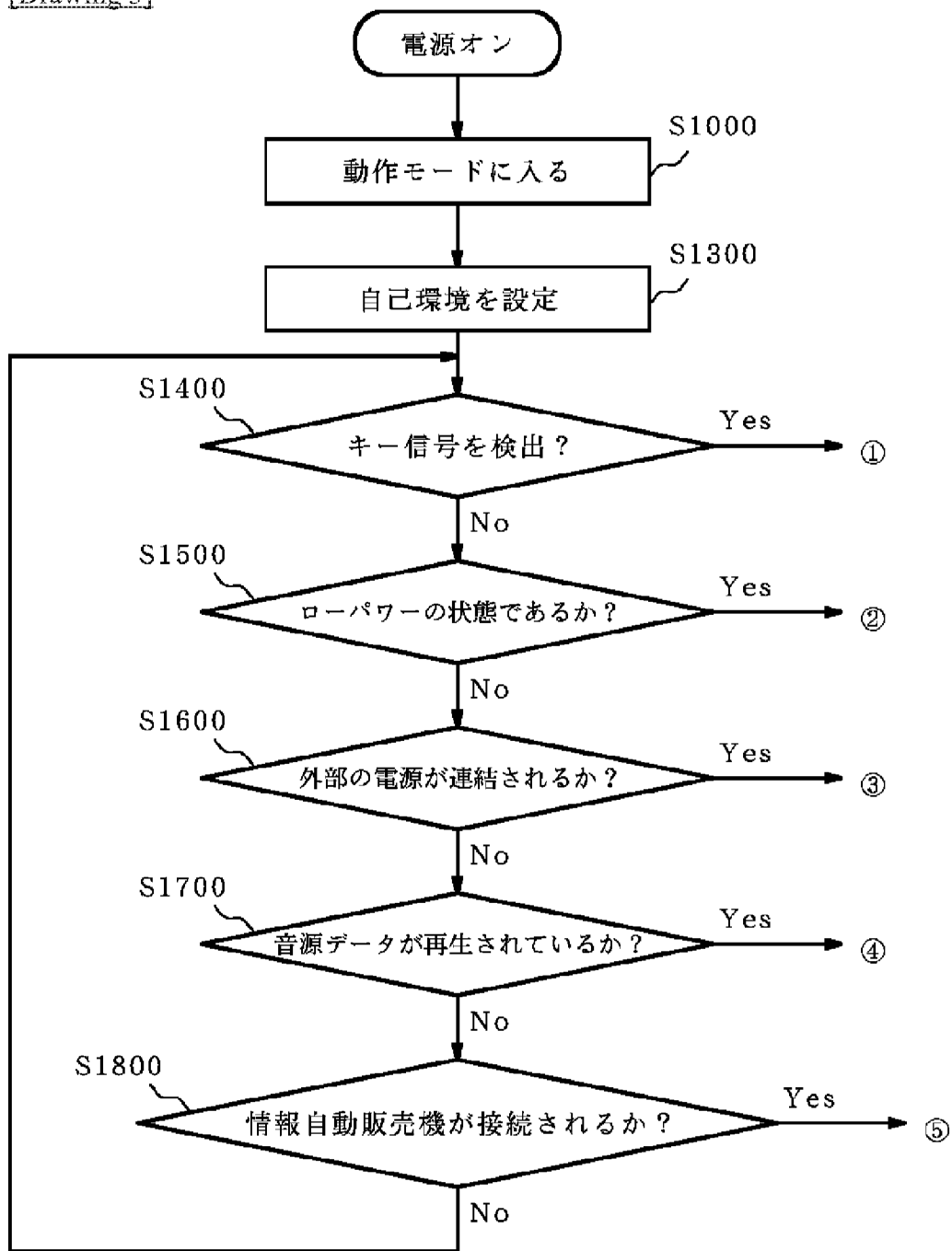
[Drawing 1]



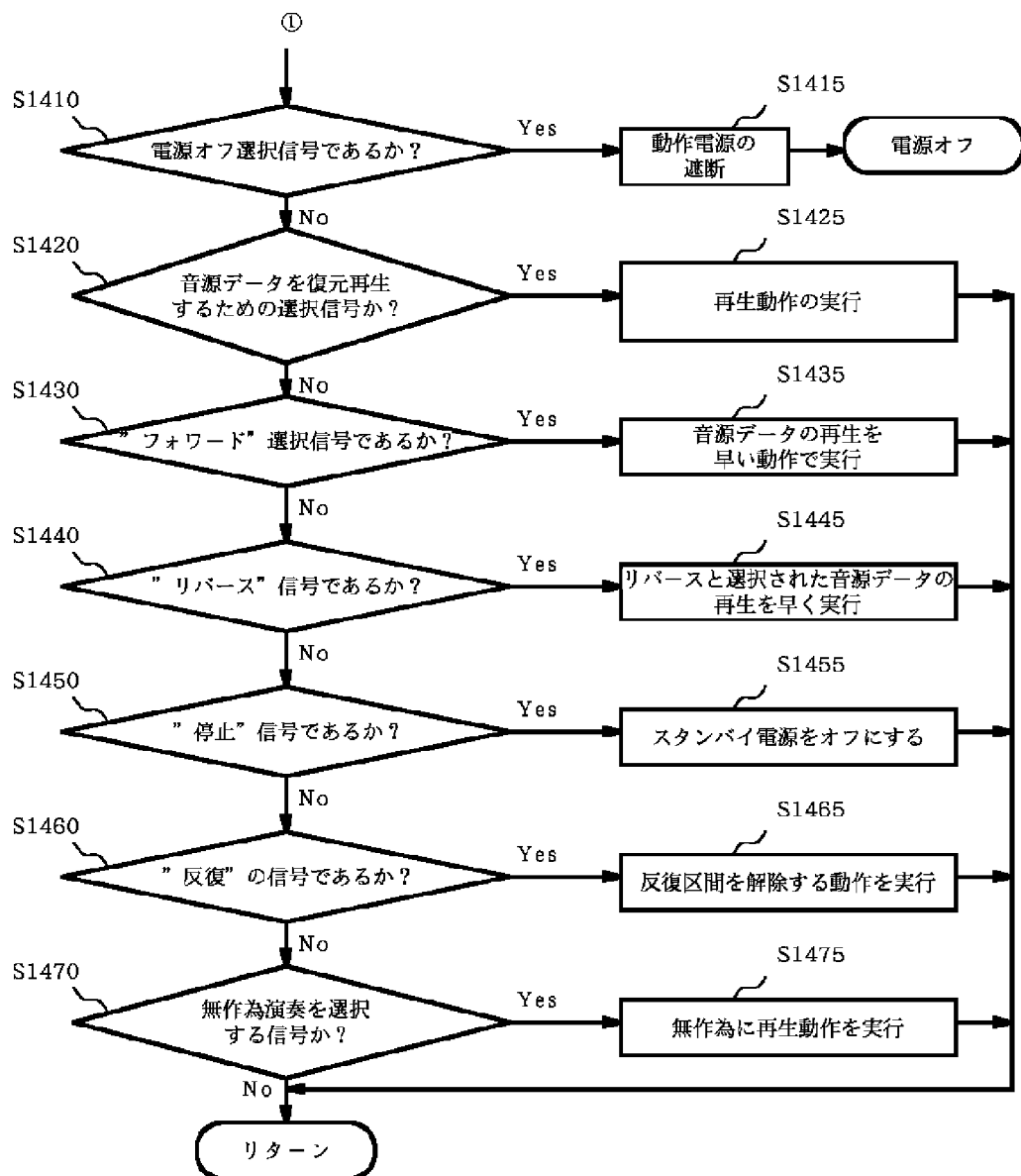
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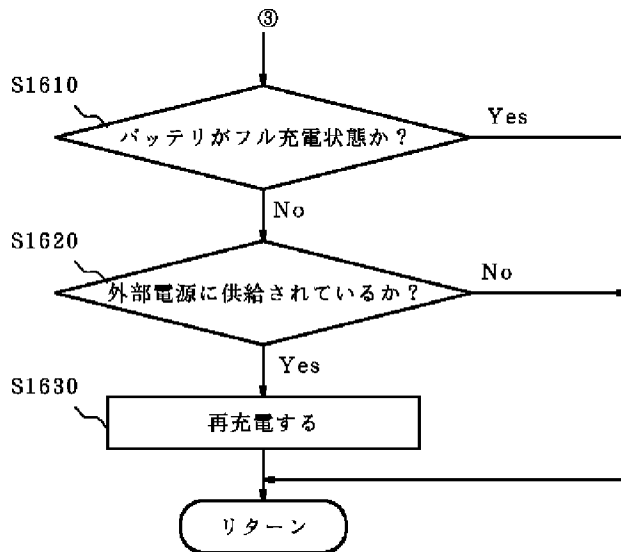
[Drawing 3]



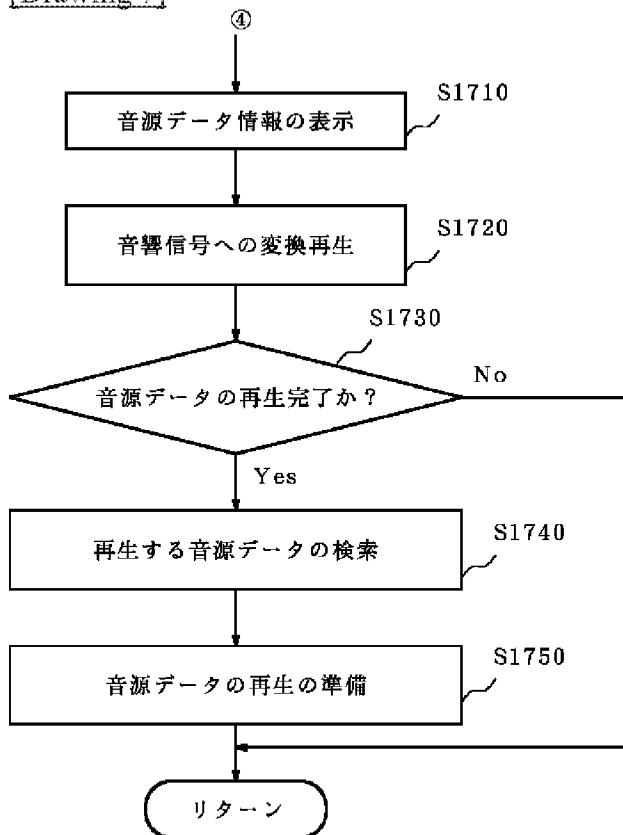
[Drawing 4]



[Drawing 6]



[Drawing 7]



[Drawing 8]



